

REMARKS

This is in response to the non-final Official Action currently outstanding with regard to the present application.

Preliminarily, Applicants wish to thank the Examiner for the courtesy accorded to their undersigned representative during a telephone interview held on 6 January 2005. During the course of that interview, the foregoing claims (note: claim 37 is slightly amended for appropriate antecedent basis reasons) and the following arguments were discussed as they apply to the Examiner's outstanding rejections in this application and the cited art. As a result of this interview, it is Applicants' undersigned representative's understanding that agreement was reached to the affect that, subject to further consideration and/or search by the Examiner and also subject to the Examiner's verification of Applicants' comments concerning the cited Hamamoto publication, the claims of this application as hereinabove amended are in condition for allowance.

Claims 1-35 were pending in this application at the time of the issuance of the currently outstanding Official Action. Claims 31-35 have been withdrawn from further consideration as a result of an election filed in response to a Requirement for Restriction. By the foregoing Amendment, Claims 1-25 and 30 are amended. Also, Claims 36 and 37 are added, and no claims are canceled. Accordingly, upon the entry of the foregoing amendment, Claims 1-30 and 36-37 will constitute the Claims under active prosecution in this application.

The claims of this application as they will stand upon the entry of this Amendment are set forth above with appropriate status identifiers as required by the Rules.

More particularly, in the currently outstanding Official Action the Examiner has:

1. Failed to acknowledge Applicants' claim for foreign priority under 35 USC 119 (a)-(d) or (f), and has failed to acknowledge the receipt of the required copies of the priority documents by the United States Patent and Trademark Office – **Appropriate acknowledgement and confirmation of these matters in response to this communication is respectfully requested in response to this communication;**

2. Failed to provide Applicants with any indication concerning the acceptability of the drawings as filed – **An indication concerning the acceptability of the drawings of this application in response to this communication is respectfully requested;**
3. Failed to acknowledge his consideration of the Information Disclosure Statement filed in this application by providing the Applicants with a copy of the Forms PTO-1449 that accompanied that Statement duly signed, dated and initialed to confirm the consideration of the art listed therein – **An appropriate acknowledgement of the Information Disclosure Statement filed in this application in response to this communication is respectfully requested;**
4. Acknowledged Applicant's election of Claims 1-30 for further prosecution in this application;
5. Rejected Claims 1-30 under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that Applicant regards as the invention;
6. Rejected Claims 1-30 under 35 USC 102(b) as being anticipated by the Michelson reference (US 6,082,617);
7. Rejected Claims 1-30 under 35 USC 102(e) as being anticipated by the Kim reference (US 6,769,949); and
8. Rejected Claims 1-30 under 35 USC 102(e) as being anticipated by the Hamamoto publication (US Pub 2000/117583)

No further comment regarding items 1-4 above is deemed to be required in these Remarks.

With respect to item 8, the Hamamoto Publication, Applicants respectfully submit that the Examiner has improperly cited and relied upon that publication. Hence, Applicants respectfully traverse the outstanding rejections insofar as they are based upon the Hamamoto publication. In support of this traversal, Applicants respectfully note that the Hamamoto Publication is cited by the Examiner as being an anticipation of the present invention as herein claimed under 35 USC 102(e). However, it is respectfully noted that the Hamamoto Publication arose from an application by the same inventors as the inventors of the present application (i.e., it is by the same inventive entity as the inventive entity of the present application) and that application is assigned to the same assignee as the assignee of the present application. Accordingly, since 35 USC 102(e) requires the cited patent or publication to be a patent or publication filed or published prior to the present application's filing date by another, Applicants respectfully submit that the Hamamoto publication relied upon by the Examiner is not an appropriate reference under the terms of 35 USC 102(e) against the present application. Hence, a decision withdrawing the currently outstanding rejections based upon the Hamamoto publication in response to this communication is respectfully requested.

With respect to item 7, the Kim reference, Applicants again respectfully traverse the Examiner's rejection. The basis of this traversal of the Examiner's rejections insofar as they are based upon the Kim reference is that that reference is inapposite to the present invention. In particular, Applicants respectfully note that the presently claimed wing portion is elastic. The wing portion in the Kim reference, on the other hand, is not elastic. Thus, it will be seen that the Kim reference indicates that the skin of the wings is not elastic (Column 5, lines 20-31) and that the frame rods supporting the skin are rigid (Column 4, lines 21-26). Further, it is to be understood that the Kim reference discloses that the tail assembly, not the wings, controls the hovering and/or lateral movement of the apparatus. This indeed is clear from the very portion of the Kim reference cited by the Examiner at Column 11, line 30 to Column 12, line 30. Hence, the elasticity of the wing portion forms no part of the Kim invention or disclosure, and also that reference is totally inapposite to the present invention with respect to the manner in which lift and thrust are imparted to the device. A decision so holding and withdrawing the currently outstanding rejections based upon the Kim reference in response to this communication, therefore, is respectfully requested.

With respect to item 6, the Michelson reference, Applicants respectfully submit that the following discussion will clarify the differences between the Michelson reference and the present invention thereby unequivocally showing that the Michelson reference does not constitute an anticipation of the presently claimed invention.

As the attached sheet of conceptual drawings illustrates, the upward and downward flapping of the wings in the Michelson reference is such that the lifting force imparted to the apparatus by the flapping wings is only present in conjunction with a lateral thrust force imparted to the apparatus by the movement of the wings at the same time. Hence, Applicants respectfully submit that in the Michelson reference the lifting force imparted to the apparatus does not exist in the absence of a thrusting force applied to the apparatus with the result that the Michelson apparatus cannot hover as can the presently claimed apparatus. In this regard, it also is to be noted that in a manner distinct from the Michelson structure, the present invention (as representatively illustrated at Figs 54 and 55) imparts a lifting force to the apparatus by the elastic deformation of the wings as they are moved up and down in a flapping motion in the surrounding fluid. In the present invention this lifting force allows the apparatus to hover unlike the Michelson apparatus because the hovering manner of driving the wings and horizontal flight imparting manner of driving the wings are distinct from one another.

Accordingly, while Michelson discusses lift applied to his device at Column 4, last paragraph and elsewhere, the description in the Michelson reference concerning the rigidity and/or flexibility of the wing arises in the context of the gas filled spars that support the wing material and the controlled release of the gas pressure as a means for controlling the lift applied to the apparatus. Therefore, while Michelson apparently contemplates some flexibility in his wing structure, that flexibility is not the same as the elasticity of the presently claimed wings. Hence, it is to be noted that at Column 11, lines 24 to 42, the Michelson reference discusses the various degrees of freedom evidenced in insect wing movement, and thereafter indicates that:

...only automatic up and down wing beating is necessary if the circulation of the air over the wings is controlled by other means, and the interstitial wing materials are made to deform predictably but differently, under aerodynamic forces of the up beat versus those of the downbeat. None of the other degrees of freedom commonly associated with insect wing movement need to be controlled from the wing root by actuators in order to generate lift, forward propulsion and navigation. (Emphasis added)

Moreover, it also should be noted that the drag coefficient of the wings C_{DW} in equation (6) of the Michelson reference (see Column 6) is an experimental value for small birds and a constant ($= 0.02$ in Michelson). Therefore, the lift coefficient C_L and drag coefficient C_D in equations (7) and (8) described in Michelson (see Columns 6 and 7) are also constant and do not depend upon the elastic deformation of the wings. On the other hand, generally speaking, it is clear to those skilled in the art that an angle of attack of the wing is changed, and the lift coefficient C_L and drag coefficient C_D are also modified if the manner in which the wing is deformed is changed. Consequently, Applicants respectfully submit that the result of a detailed review of the Michelson reference reveals that that reference nowhere discloses, teaches or suggests that a lifting force without a thrust component can be generated directly by an elastic deformation of the wings as they flap up and down, i.e., that the lift and thrust forces imparted to the apparatus by the movement of the wings in the surrounding fluid can be effectively separated.

Additional support for the foregoing position arises from the fact that in the Michelson reference the forward flight velocity U in equation 12 (see Column 7) is not equal to zero ($U \neq 0$) because the power necessary for the rising of the Michelson apparatus becomes infinite when the forward flight velocity of the Michelson apparatus is equal to zero.

In summary, Applicants respectfully submit that the Michelson reference is limited to the disclosure of obtaining lift and thrust at the same time. Therefore, the Michelson reference does not teach, disclose or suggest obtaining lift by elastic deformation of the wing by the surrounding fluid while such thrust as may be imparted to the device is determined by the shifting of the disposition of the wings in a plane perpendicular to the vertically upward lift applied to the device by the elastic deformation resulting from the up and down motion of the wings in the surrounding fluid.

In view of the forgoing Amendment (which clarifies the wording of the claims in a manner believed to clearly and distinctly state the subject matter that Applicants regard as their invention and to remove the bases for the Examiner's outstanding rejection under 35 USC 112, second paragraph, referred to in item 5 above) and Remarks (which show the inappropriate nature of one prior art citation, the inapposite nature of another prior art citation to the present invention, and the clear distinctions between the present invention as claimed from the disclosure of the last prior art citation), Applicants respectfully submit that this application now is in condition for allowance. A decision so holding and allowing this application as hereinabove amended in response to this communication therefore is respectfully requested.

Applicant also believes that additional fees beyond those submitted herewith are not required in connection with the consideration of this response to the currently outstanding Official Action. However, if for any reason a fee is required, a fee paid is inadequate or credit is owed for any excess fee paid, you are hereby authorized and requested to charge and/or credit Deposit Account No. 04-1105, as necessary, for the correct payment of all fees which may be due in connection with the filing and consideration of this communication.

Respectfully submitted,

Date: January 6, 2005

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SIGNATURE OF PRACTITIONER

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